ACG/VGS/ODSGNA Regional Postgraduate Course

Prevention and Management of Colonoscopy Complications

September 6, 2014

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Indications

• Screening & surveillance
  – Polyps, colon cancer, IBD

• Signs & symptoms
  – Gastrointestinal bleeding & iron deficiency anemia
  – Abnormalities found on a radiologic study
  – Pain, chronic diarrhea

• Therapeutic interventions
  – Polypectomy
  – Location and demarcation of lesions
  – Decompression of volvulus
  – Stent placement

Contraindications

• Peritonitis
• Perforation
• Severe diverticulitis
• Fluminant colitis
• Hemodynamic instability
• Large bowel obstruction
• Contraindication to sedation
Risk factors: Age, Charleston comorbidity score, invasive procedure (foreign body removal, submucosal injection, hemostasis) Arora GIE 69:3; 2009.
<table>
<thead>
<tr>
<th>Study Setting</th>
<th>Number of Examinations</th>
<th>Death</th>
<th>Perforation</th>
<th>Gastrointestinal Bleeding</th>
<th>Postpolypectomy Syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levin et al., 2006&lt;sup&gt;12&lt;/sup&gt;</td>
<td>16,318</td>
<td>10 (0.06%)</td>
<td>15 (0.9%)</td>
<td>55 (3.3%)</td>
<td>6 (0.04%)</td>
</tr>
<tr>
<td>Warren et al., 2009&lt;sup&gt;13&lt;/sup&gt;</td>
<td>53,820</td>
<td>32 (0.09%)</td>
<td>33 (0.6%)</td>
<td>342 (0.64%)</td>
<td>NR</td>
</tr>
<tr>
<td>Ko et al., 2009&lt;sup&gt;13&lt;/sup&gt;</td>
<td>21,375</td>
<td>2 (0.01%)</td>
<td>4 (0.02%)</td>
<td>34 (1.6%)</td>
<td>2 (0.01%)</td>
</tr>
<tr>
<td>Sasser et al., 2006&lt;sup&gt;14&lt;/sup&gt;</td>
<td>57,091</td>
<td>5 (0.07%)</td>
<td>18 (0.3%)</td>
<td>137 (0.14%)</td>
<td>NR</td>
</tr>
<tr>
<td>Imperiale et al., 2009&lt;sup&gt;15&lt;/sup&gt;</td>
<td>26,195</td>
<td>0 (0%)</td>
<td>1 (0.04%)</td>
<td>3 (0.11%)</td>
<td>NR</td>
</tr>
<tr>
<td>Mendel et al., 1999&lt;sup&gt;16&lt;/sup&gt;</td>
<td>12,146</td>
<td>NR</td>
<td>4 (0.03%)</td>
<td>11 (0.11%)</td>
<td>NR</td>
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<tr>
<td>Vitale et al., 2007&lt;sup&gt;17&lt;/sup&gt;</td>
<td>43,598</td>
<td>3 (0.06%)</td>
<td>21 (0.49%)</td>
<td>49 (1.1%)</td>
<td>22 (0.51%)</td>
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<tr>
<td>Goff et al., 2007&lt;sup&gt;18&lt;/sup&gt;</td>
<td>16,896</td>
<td>4 (0.03%)</td>
<td>27 (0.2%)</td>
<td>NR</td>
<td>NR</td>
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<tr>
<td>Korman et al., 2007&lt;sup&gt;19&lt;/sup&gt;</td>
<td>116,000</td>
<td>NR</td>
<td>27 (0.3%)</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Anderson et al., 2006&lt;sup&gt;20&lt;/sup&gt;</td>
<td>116,000</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
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<tr>
<td>Nelson et al., 2002&lt;sup&gt;21&lt;/sup&gt;</td>
<td>VA cooperative study, screening colonoscopy</td>
<td>2156</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>6 (0.2%)</td>
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<tr>
<td>Sieg et al., 2001&lt;sup&gt;22&lt;/sup&gt;</td>
<td>Germany</td>
<td>82,416</td>
<td>2 (0.00%)</td>
<td>13 (0.01%)</td>
<td>38 (0.05%)</td>
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<tr>
<td>Tran et al., 2001&lt;sup&gt;23&lt;/sup&gt;</td>
<td>US teaching hospital</td>
<td>26,102</td>
<td>1 (0.004%)</td>
<td>21 (0.08%)</td>
<td>NR</td>
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<tr>
<td>Rothgeb and Wex, 2002&lt;sup&gt;24&lt;/sup&gt;</td>
<td>US community practice</td>
<td>32,497</td>
<td>0 (0%)</td>
<td>2 (0.01%)</td>
<td>4 (0.13%)</td>
</tr>
<tr>
<td>Johnson et al., 2002&lt;sup&gt;25&lt;/sup&gt;</td>
<td>CT colonography study</td>
<td>2951</td>
<td>NR</td>
<td>NR</td>
<td>3 (0.003%)</td>
</tr>
<tr>
<td>Farley et al., 1997&lt;sup&gt;26&lt;/sup&gt;</td>
<td>Mayo Clinic</td>
<td>57,038</td>
<td>NR</td>
<td>43 (0.08%)</td>
<td>NR</td>
</tr>
<tr>
<td>Lanning et al., 1997&lt;sup&gt;27&lt;/sup&gt;</td>
<td>Dutch teaching hospital</td>
<td>30,905</td>
<td>NR</td>
<td>35 (0.11%)</td>
<td>NR</td>
</tr>
<tr>
<td>Ishizual et al., 2005&lt;sup&gt;28&lt;/sup&gt;</td>
<td>Mayo Clinic</td>
<td>78,702</td>
<td>72 (0.08%)</td>
<td>NR</td>
<td>NR</td>
</tr>
</tbody>
</table>

Complications were variably defined across studies and length of follow-up differed.

Abbreviations: NR, not reported; SEER, Surveillance, Epidemiology and End Results Program.
Complications

- Bleeding (0.05 – 0.63%)
- Perforation (0 – 0.12%)
- Infection
- Missed lesions
- Pain
- Death (0 – 0.09%)
- Rare complications
Missed Lesions

- Improvements in detection
  - Glass fibers → video capture
  - High flow irrigation
  - Improved resolution and illumination
  - Filters to enhance visualization

- Polyp missed detection rate 28%
- Adenoma miss rate 21%
- Miss rate ≥ 5mm 12%
- Miss rate ≥ 5mm adenoma 9%


Bleeding
98 y/o F with blood with bright red blood in the stool. Wears diapers and the blood filled the diaper, 2 more bloody BM, 1 in the ED and 1 after arriving. Dizziness on standing at baseline, more dizzy with standing today. Never had a colonoscopy.

BP 165/68  HR 52  RR 18  SPO2 96

GEN: awake, alert and oriented to person, place, time, and situation, comfortable, fluent speech, articulate.

Psychiatric: Cooperative, appropriate mood & affect.

Gastrointestinal: Soft, normoactive bowel sounds, dark red blood in diaper, in gluteal cleft, without signs of hemorrhoids, dark red blood on rectal exam, mild epigastric tenderness.

<table>
<thead>
<tr>
<th>140(Na)</th>
<th>108(Cl)</th>
<th>19(BUN)</th>
<th>13.0(Hgb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.7(K)</td>
<td>25(CO₂)</td>
<td>0.91(Cr)</td>
<td>39.4(Hct)</td>
</tr>
</tbody>
</table>

Perforation

- **Mechanism**
  - Mechanical trauma (rectosigmoid, site of stricture)
  - Barotrauma (esp cecum)
  - Cautery injury during polypectomy
  - Colonoscope knuckling

- **Risk factors**
  - Advanced age
  - Multiple comorbidities
  - Colonic disease (IBD, malignancy, radiation, diverticulosis)
  - Resection of large / right sided polyps
  - Therapeutic maneuvers
**Perforation Incidence**

- Screening colonoscopy: 0.01 - 0.1 %
- Stent placement: 4 %
- Anastomotic stricture dilation: 0 - 6 %
- Crohn’s disease stricture dilation: 0 - 18 %
- Colonic decompression tube placement: 2 %
- Colonic endoscopic mucosal resection 0 - 5 %


**Factors Affecting Risk**

- Endoscopist with high procedure volume
- Reduced mobility of the colon
- Mucosal abnormalities (IBD, radiation, partial tear)
- Submucosal injection (large, right sided, flat)
- Avoid dilation in regions of inflammation
- Minimize air insufflation
- Avoid colonic stents with bevacizumab

Presentations

- Pain, fever, nausea, vomiting, dyspnea
- Absence of bowel sounds
- Atypical symptoms with retroperitoneal perforation
- Abdominal tenderness
- Peritoneal signs


Work-up

- Abdominal X-ray (plain and upright)
- Upright chest radiograph
- In some cases, CT abdomen and pelvis
- Intravenous fluids
- Broad spectrum antibiotics
- Surgical consultation
  - Peritonitis
  - Clinical decompensation
  - Concomitant surgical indication (mass)
  - Asymptomatic pneumoperitoneum is NOT an indication

Infection

- Aspiration
- IV site infections
- Hepatitis B & C
- Bacterial infection

- Defective equipment
- Breach in protocol for reprocessing

Other complications

• Post polypectomy syndrome
  – Electrocautery injury to the bowel wall
  – Transmural injury
  – Focal peritonitis without perforation
  – Fever, tenderness, leukocytosis
  – IVF, hydration, bowel rest

• Gas explosion
• Splenic injury / hematoma

Good judgment comes from experience, and experience comes from bad judgment.

— Dr. David Carr-Locke
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